

# SE MRC College Algebra Content Review

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## Combinations of Functions; Composite Functions Section 2.6

### Learning Objectives:

1. Find the domain of a function.
2. Combine functions using the algebra of functions, specifying domains.
3. Form composite functions.
4. Determine domains for composite functions.
5. Write functions as compositions.

3. Find the domain of the function.

$$f(x) = x^2 - 2x - 14$$

What is the domain of  $f$ ?

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1. Find the domain of the function.

$$f(x) = 4(x - 7)$$

What is the domain of  $f$ ?

4. Find the domain of the function.

$$f(x) = \frac{16}{x^2 - 3x - 130}$$

What is the domain of  $f$ ?

2. Find the domain of the function.

$$f(x) = \frac{15}{x - 7}$$

What is the domain of  $f$ ?

5. Find the domain of the function.

$$f(x) = \sqrt{x + 13}$$

What is the domain of f?

8. Find  $f + g$ ,  $f - g$ ,  $fg$  and  $\frac{f}{g}$ . Determine the domain for each function.

$$f(x) = 3x + 8, \quad g(x) = x + 4$$

$$(f + g)(x) =$$

What is the domain of  $f + g$ ?

6. Find the domain of the function.

$$f(x) = \frac{1}{\sqrt{x - 13}}$$

What is the domain of f?

$$(f - g)(x) =$$

What is the domain of  $f - g$ ?

$$(fg)(x) =$$

What is the domain of  $fg$ ?

7. Find the domain of the function.

$$f(x) = \sqrt{10 - 2x}$$

What is the domain of f?

$$\left(\frac{f}{g}\right)(x) =$$

What is the domain of  $\frac{f}{g}$ ?

9. Find  $f + g$ ,  $f - g$ ,  $fg$  and  $\frac{f}{g}$ . Determine the domain for each function.

$$f(x) = 2x^2 + 4x - 48, \quad g(x) = x + 6$$

a.  $(f + g)(x) =$

b. What is the domain of  $f + g$ ?

c.  $(f - g)(x) =$

d. What is the domain of  $f - g$ ?

e.  $(fg)(x) =$

f. What is the domain of  $fg$ ?

g.  $(\frac{f}{g})(x) =$

h. What is the domain of  $\frac{f}{g}$ ?

10. For  $f(x) = x + 4$  and  $g(x) = 2x + 1$ , find the following functions.

a.  $(fog)(x) =$

b.  $(gof)(x) =$

c.  $(fog)(-1) =$

d.  $(gof)(-1) =$

11. For  $f(x) = 3x - 2$  and  $g(x) = 5x^2 - 4$ , find the following functions.

a.  $(fog)(x) =$

b.  $(gof)(x) =$

c.  $(f \circ g)(0) =$

d.  $(g \circ f)(0) =$

12. For  $f(x) = \sqrt{x}$  and  $g(x) = x - 1$ , find the following functions.

a.  $(f \circ g)(x) =$

b.  $(g \circ f)(x) =$

c.  $(f \circ g)(2) =$

d.  $(g \circ f)(2) =$

Answer Key:

1.		$(-\infty, \infty)$
2.		$(-\infty, 7) \cup (7, \infty)$
3.		$(-\infty, \infty)$
4.		$(-\infty, -10) \cup (-10, 13) \cup (13, \infty)$
5.		$[-13, \infty)$
6.		$(13, \infty)$
7.		$(-\infty, 5]$
8.	a.	$4x+12$
	b.	$(-\infty, \infty)$
	c.	$2x+4$
	d.	$(-\infty, \infty)$
	e.	$3x^2 + 20x + 32$
	f.	$(-\infty, \infty)$
	g.	$\frac{3x+8}{x+4}$
	h.	$(-\infty, -4) \cup (-4, \infty)$
9.	a.	$2x^2 + 5x - 42$
	b.	$(-\infty, \infty)$
	c.	$2x^2 + 3x - 54$
	d.	$(-\infty, \infty)$
	e.	$2x^3 + 16x^2 - 24x - 288$
	f.	$(-\infty, \infty)$
	g.	$2x - 8$
	h.	$(-\infty, -6) \cup (-6, \infty)$
10.	a.	$2x + 5$
	b.	$2x + 9$
	c.	$3$
	d.	$7$
11.	a.	$15x^2 - 14$
	b.	$45x^2 - 60x + 16$
	c.	$-14$
	d.	$16$
12.	a.	$\sqrt{x-1}$
	b.	$\sqrt{x} - 1$
	c.	$1$
	d.	$\sqrt{2} - 1$